

Claim 1 (currently amended): A method for identifying an interacting target

biomolecule to a biomolecule of interest comprising the steps of:

- (a) providing a biomolecule of interest having specificity for the target;
- (b) binding the biomolecule of interest to at least one type of linker molecule, the linker molecule ~~comprising~~ including at least one attachment part for binding to the biomolecule of interest, one cleavable part, one mass marker part and one photoactivatable part, for binding to the target;
- (c) contacting the biomolecule of interest with a cell or a cell extract;
- (d) exposing the cell to photolysis, whereby the photoactivatable part binds to the target;
- (e) cleaving the linker molecule or molecules, thereby leaving the photoactivatable part and the mass marker part bound to the target; and
- (f) analysing the product of step (e), thereby detecting the mass marker part, thus identifying the interacting target biomolecule to the biomolecule of interest.

Claim 2 (currently amended): ~~A method according to~~ The method of claim 1, wherein the biomolecule of interest is a protein or a peptide.

Claim 3 (currently amended): ~~A method according to~~ The method of claim 1, wherein the target biomolecule is a protein or a peptide.

Claim 4 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the affinity of the biomolecule of interest for the target biomolecule is in the interval of 10 mM to 0.1 pM.

Claim 5 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the attachment part of the linker molecule is designed to bind to a specific amino acid residue of the biomolecule of interest.

Claim 6 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the attachment part of the linker molecule is a N-hydroxysuccinimide moiety or a N-maleimide.

Claim 7 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the cleavable part of the linker molecule is cleaved by chemical means.

Claim 8 (currently amended): ~~A method according to~~The method of claim 6, wherein the cleavable part is cleaved by an oxidising agent or by a base agent.

Claim 9 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the cleavable part is a geminal diol or an ester linkage.

Claim 10 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the mass marker part has the ability to fragment during the analysis step.

Claim 11 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the mass marker part is thioethylpyridine.

Claim 12 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein at least two different linker molecules are used.

Claim 13 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the photoactivatable part is an azide or a benzophenone.

Claim 14 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the linker molecule is 2-benzophenon-4-yl-carbonylamino-4, 5-dihydroxy-6-(N-succinimidyl)-1-(4-pyridylethylthio)-3-n-hexanone.

Claim 15 (currently amended): ~~A method according to any one of the preceding claims~~The method of claim 1, wherein the linker molecule further comprises a fluorescent protein tag.

Claim 16 (currently amended): ~~A method according to any one of the preceding claims~~ The method of claim 1, wherein the linker molecule comprises a tag directing it to a subcellular location.

Claim 17 (currently amended): ~~A method according to any one of the preceding claims~~ The method of claim 1, wherein the cell of step (c) is perforated, in the form of a cell extract or in a cell-free translation system.

Claim 18 (currently amended): ~~A method according to any one of the preceding claims~~ The method of claim 1, wherein the photolysis of step (d) is performed by exposing the cell to UV-light.

Claim 19 (currently amended): ~~A method according to step~~ The method of claim 18, wherein the photolysis is repeated at least once.

Claim 20 (currently amended): ~~A method according to any one of the preceding claims~~ The method of claim 1, wherein the product of step (d) is chemically and/or enzymatically digested.

Claim 21 (currently amended): ~~A method according to~~ The method of claim 20, wherein the digestion is performed by cyanogen bromide and/or trypsin.

Claim 22 (currently amended): ~~A method according to any one of the preceding claims~~ The method of claim 1, wherein step (f) is multidimensional HPLC coupled to a mass spectrometer (MS).

Claim 23 (currently amended): ~~A method according to~~ The method of claim 22,
wherein the MS is in a parent ion scanning mode.

Claim 24 (currently amended): ~~A method according to~~ The method of claim 23,
wherein the molecules comprising the marker is detected at 106 m/z.

Claim 25 (currently amended): ~~A method according to~~ The method of claim 24,
wherein the MS operates in a data-dependent mode, thereby switching from parent
ion to daughter ion scanning mode when a peptide containing the marker is detected.

Claims 26-27 (cancelled)